CITY OF NEW PLYMOUTH (PWS 3380008)
SOURCE WATER ASSESSMENT FINAL REPORT

December 6, 2000

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area and sensitivity factors associated with the wells and aquifer characteristics.

This report, *Source Water Assessment for City of New Plymouth, Idaho*, describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should not be used as an absolute measure of risk and they should not be used to undermine public confidence in the water system.**

The City of New Plymouth drinking water system consists of three wells, of which Wells #7 and #8 account for the majority of the use, and Well #6 is a backup well. Due to a moderate rating in hydrologic sensitivity and moderate system construction, the three wells rank as moderate susceptibility to inorganic contamination, volatile organic contamination, synthetic organic contamination, and microbial contaminants. In November 1988, Well #6 water showed detection for the synthetic organic contaminants Heptachlor and Dacthal. In early 1993, Well #6 water recorded detections of total coliform bacteria and E-coli bacteria. Since April 1993, the only total coliform bacteria detections have been in various locations in the city. Nitrate levels have been steadily decreasing in recent years.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

For the City of New Plymouth, source water protection activities should focus on implementation of practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas. The City of New Plymouth should also be aware of the Group 1 site for the SOCs Atrazine and Simazine located about 100 feet from Well #8. Most of the designated areas are outside the direct jurisdiction of the City of New Plymouth. Partnerships with state and local agencies and industry groups should be established and are critical to success. The City should remain diligent in following the Wellhead Protection Ordinance. A new sanitary survey should be conducted on each of the wells. Disinfection practices should be maintained to reduce the risk of microbial contamination. Due to the time involved with the movement of ground water, source water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the Gem Soil and Water Conservation District, and the Natural Resources Conservation Service.

A community with a fully developed source water protection program will incorporate many strategies. For assistance in developing protection strategies please contact the Boise Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR CITY OF NEW PLYMOUTH, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings used to develop the assessment also is attached.

Background

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

Level of Accuracy and Purpose of the Assessment

Since there are over 2,900 public water sources in Idaho, there is limited time and resources to accomplish the assessments. All assessments must be completed by May of 2003. An in-depth, site-specific investigation of each significant potential source of contamination is not possible. **Therefore, this assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of the assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The Idaho Department of Environmental Quality (DEQ) recognizes that pollution prevention activities generally require less time and money to implement than treatment of a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a source water protection program should be determined by the local community based on its own needs and limitations. Wellhead or source water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The City of New Plymouth wells are community wells that serve approximately 1,300 people with 575 total connections. The wells are located in Payette County, at various location in the City of New Plymouth (Figure 1). The public drinking water system for City of New Plymouth is comprised of three wells.

No significant water chemistry problems have been recorded in the well water from Wells #7 and #8. In February and March 1993, Well #6 recorded total coliform bacteria and E-coli bacteria. It was determined that these bacteria were associated with the distribution system. Well #6 has had no bacteria contamination problems since that time. No inorganic contaminant (IOC) (i.e. nitrate) has been recorded above the Maximum Contaminant Level (MCL). Volatile organic contaminants (VOCs) have never been detected in any of the drinking water. Synthetic organic contaminants (SOCs) were detected in Well #6 water in 1988. Though no significant water chemistry problems currently exist, the possibility of contamination from agricultural chemical use remains high.

Defining the Zones of Contribution - Delineation

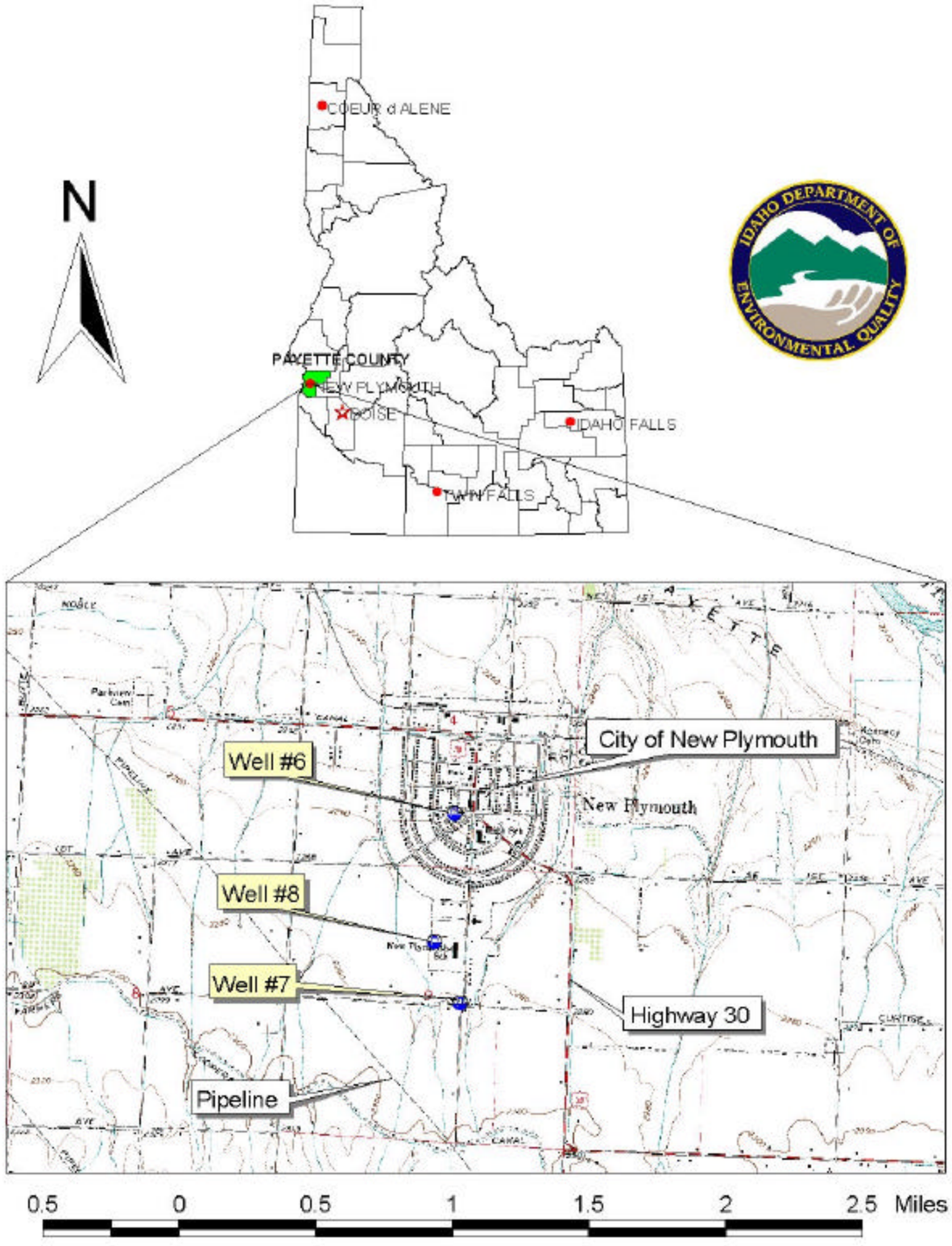
The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel (TOT) zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. DEQ used a refined computer model approved by the EPA in determining the 3-year (Zone 1B), 6-year (Zone 2), and 10-year (Zone 3) TOT for water associated with the Payette Valley aquifer in the vicinity of City of New Plymouth. The computer model used site specific data; assimilated by DEQ from a variety of sources including the City of New Plymouth well logs for Wells #6, #7, and #8, and other local area well logs. The delineated source water assessment areas for the City of New Plymouth wells can best be described as a series of corridors approximately ½ mile to 1 mile wide and about 2 miles long extending south to Interstate 84 (Figure 2). The actual data used by DEQ in determining the source water assessment delineation areas are available upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and from available databases.

The dominant land use outside the City of New Plymouth area is irrigated agriculture. Land use within the immediate area of the wellheads consists of residential, urban, and agricultural uses.

Figure 1. Geographic Location of City of New Plymouth Wells #6, #7, and #8



It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A two-phased contaminant inventory of the study area was conducted during June of 2000. The first phase involved identifying and documenting potential contaminant sources within the City of New Plymouth Source Water Assessment Area through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ. The second or enhanced phase of the contaminant inventory involved contacting the operator to validate the sources identified in phase one and to add any additional potential sources in the area. This task was undertaken with the assistance of Harley Watson.

Since the delineated source water areas encompass various portions of the New Plymouth area, the different wells have different numbers and types of potential contaminant sources. Well #6 has 5 potential contaminant sites (Table 1). Well #7 has 3 potential contaminant sources (Table 2). Well #8 has 4 potential contaminant sources (Table 3). The sources include three dairies, a contractor, a trucking facility, a pipeline, along with multiple businesses having underground storage tanks (UST) and one having an incomplete leaking underground storage tank (LUST) cleanup. Additionally, the town of New Plymouth contained a Group 1 priority site. The delineations for Wells #6 and #8 also contain Interstate 84 and Highway 30, which are potentially contaminant sources for all types of contaminants. Well #7 contains Highway 30 and the intersection of Highway 30 and Highway 72. Figure 2 shows the locations of these various potential contaminant sites relative to the wellheads.

Figure 2. City of New Plymouth Wells #6, #7, and #8 Delineations and Potential Contaminant Locations

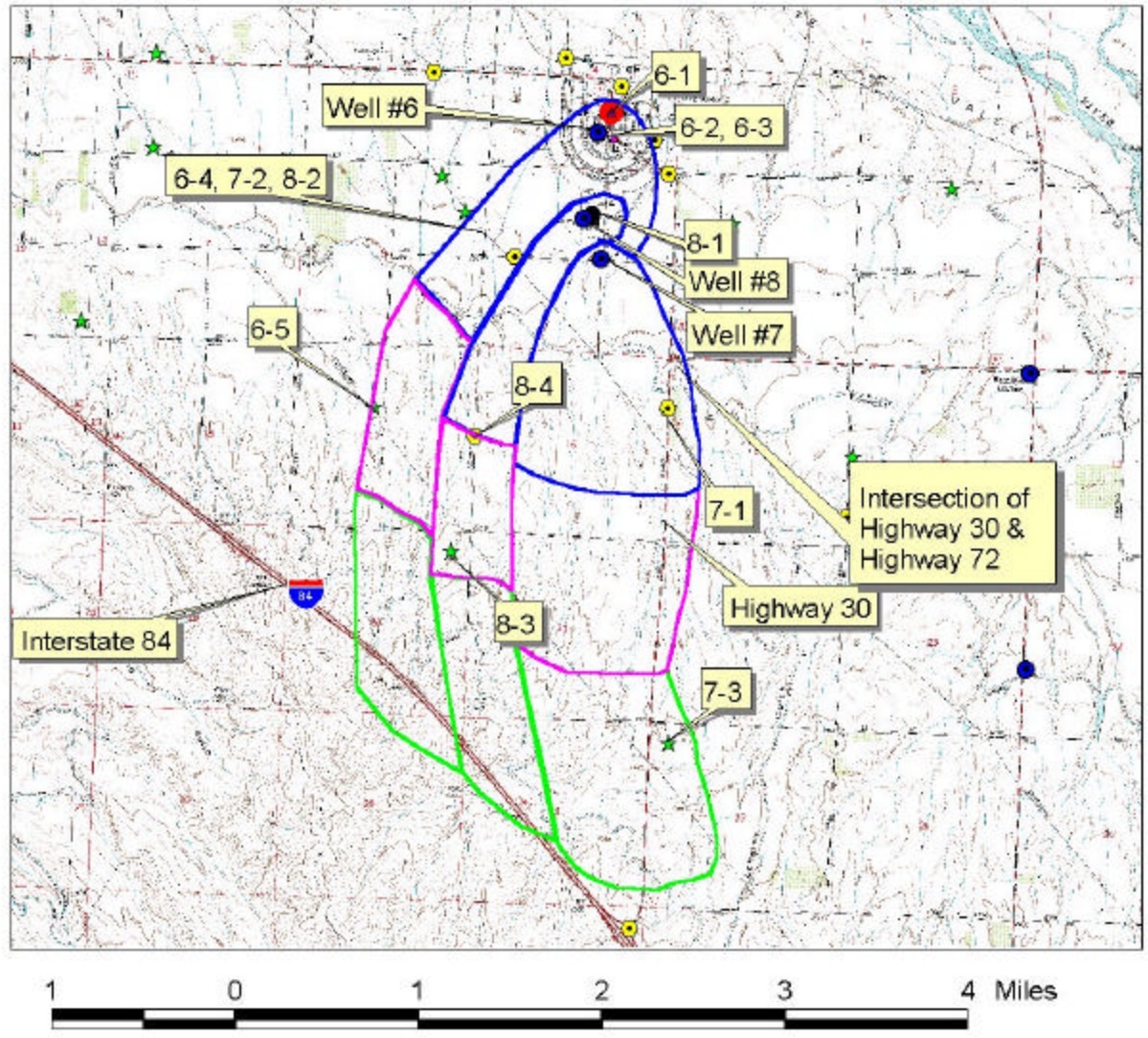


Table 1. City of New Plymouth Well #6, Potential Contaminant Inventory

SITE #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
6-1	LUST	0-3	Database Search	VOC, SOC
6-2	UST	0-3	Database Search	VOC, SOC
6-3	UST	0-3	Database Search	VOC, SOC
6-4	Pipeline	0-3	Database Search	VOC, SOC
	Highway 30	0-3	Database Search	IOC, VOC, SOC, Microbes
6-5	Dairy (201-500 cows)	3-6	Database Search	IOC, SOC
	Interstate 84	6-10	Database Search	IOC, VOC, SOC

[1] UST = underground storage tank, LUST = leaking underground storage tank
[2] TOT = time of travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Table 2. City of New Plymouth Well #7, Potential Contaminant Inventory

SITE #	Source Description	TOT Zone[1] (years)	Source of Information	Potential Contaminants[2]
7-1	Welding Shop	0-3	Database Search	VOC
7-2	Pipeline	0-3	Database Search	VOC, SOC
	Highway 72	0-3	Database Search	IOC, VOC, SOC, Microbes
	Highway 30	0-10	Database Search	IOC, VOC, SOC, Microbes
7-3	Dairy (≤ 200 cows)	6-10	Database Search	IOC, SOC

[1] TOT = time of travel (in years) for a potential contaminant to reach the wellhead
[2] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Table 3. City of New Plymouth Well #8, Potential Contaminant Inventory

SITE #	Source Description[1]	TOT Zone[2] (years)	Source of Information	Potential Contaminants[3]
8-1	Group 1 Site	0-3	Database Search	SOC
8-2	Pipeline	0-3	Database Search	VOC, SOC
8-3	Dairy (201-500 cows)	3-6	Database Search	IOC, SOC
8-4	Excavating Contractor	3-6	Database Search	VOC, SOC
	Interstate 84	6-10	Database Search	IOC, VOC, SOC

[1] Group 1 Site = site showing elevated levels of the SOCs atrazine and simazine and are not contained within a general priority coverage
[2] TOT = time of travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

Hydrologic sensitivity was moderate for Wells #6, #7 and #8 (Table 5). This reflects the nature of the soils being in the poorly-drained to moderately-drained class, and the vadose zone (zone from land surface to the water table) being made predominantly of low permeability clay. Factors that could increase the possibility of contaminant transport include the first ground water being located within 20 feet of ground surface, and the lack of a laterally extensive low permeability unit of at least 50 feet cumulative thickness.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. The City of New Plymouth drinking water system consists of three wells that extract ground water for domestic and commercial uses. The well system construction scores were moderate for the Wells #6, #7, and #8.

All three wells are due to have a new sanitary survey completed, which will help determine if the wells are in compliance with wellhead and surface seal standards and whether they are protected from surface flooding. Wells #6 and #7 have well houses, casing raised at least 18 inches above grade, and are protected from flooding. Well #7 has a concrete floor. The wells do not have any pretreatment or disinfection systems. Well logs were available for Wells #6, #7, and #8, so a determination was made as to whether the casing and annular seals had been extended into low permeability units and whether current public water system (PWS) construction standards were being met.

The Well #6 log shows that the casing and annular seal do not extend into a low permeability unit. The well was drilled to 78 feet below ground surface (bgs). The water table was identified at 12 feet bgs. A well screen was installed from 68 feet bgs to 78 feet bgs. A surface seal was installed to a depth of 25 feet bgs into brown sand. Though the well may have been in compliance with standards when it was drilled in 1968, current PWS well construction standards are more stringent.

The Well #7 log shows that the casing and annular seal do extend into a low permeability unit. The well was drilled to 100 feet bgs. The water table was identified at 14 feet bgs. Well screens were installed from 50 to 70 feet bgs. A surface seal was installed to a depth of 22 feet bgs into yellow clay. The well was gravel packed across its entire length. Blue clay was encountered at 95 feet bgs. Though the well may have been in compliance with standards when it was drilled in 1978, current PWS well construction standards are more stringent.

The Idaho Department of Water Resources *Well Construction Standards Rules (1993)* require all PWSs to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works (1997)* during construction. A portion of Table 1 of the *Recommended Standards for Water Works (1997)* is reproduced showing the required steel casing thickness and those that were used in constructing Wells #6, #7, and #8 (Table 4).

Table 4. Portion of Table 1 from the *Recommended Standards for Water Works (1997)* Steel Casing thickness requirements.

Pipe diameter (in.)	Required thickness (in.)	Well #6 thickness	Well #7 thickness	Well #8 thickness
8	0.322	0.250	NA	NA
10	0.365	NA	0.250	0.365
12	0.375	NA	0.375	NA
18	0.375	NA	0.375	NA

The Well #8 log shows that the casing and annular seal do extend into a low permeability unit. The well was drilled to 89 feet bgs. The water table was identified at 16 feet bgs. Well screens were installed from 50 feet bgs to 70 feet bgs. A surface seal was installed to a depth of 45 feet bgs into a brown clay layer. The well was gravel packed from 45 feet bgs to 89 feet bgs. Blue clay was encountered at 78 feet bgs. The well, completed in 1997, is in compliance with current construction standards.

The well logs obtained for the City of New Plymouth system show that the blue clay is encountered at about 80 to 100 feet bgs. All three wells are completed in the upper unconfined to semi-confined aquifer above the blue clay layer.

Potential Contaminant Source and Land Use

Well #6 and Well #7 rated high for inorganic chemicals (IOCs) (i.e. nitrate). Well #8 rated moderate for IOCs. All three wells rated moderate for synthetic organic chemicals (SOCs) (i.e. pesticides) and volatile organic chemicals (VOCs) (i.e. petroleum products). The three wells rated low for microbial contaminants. Commercial land uses in the delineated source area contributed the largest numbers of VOC and SOC points to the contaminant inventory rating. Agricultural land uses contributed the most points to the IOC contaminant inventory rating. Interstate 84, Highway 30, and Highway 72 could potentially contribute IOCs, VOCs, SOCs, and microbial contaminants to Wells #6 and #8, Wells #6 and #7, and Well #7, respectively.

In November 1988, Well #6 water showed detection for the synthetic organic contaminants Heptachlor and Dacthal. In early 1993, Well #6 water recorded detections of total coliform bacteria and E-coli bacteria, though it was determined that there was a problem with the distribution system. Since April 1993, the only total coliform bacteria detections have been in various locations in the town. Nor have any other categories of contamination have been recorded in the well water.

Final Susceptibility Ranking

A detection above a drinking water standard Maximum Contaminant Level (MCL), a detection of total coliform bacteria or E-coli bacteria, or a detection of VOC or SOC at the wellhead will automatically give a high susceptibility rating to a well despite the land use of the area because a pathway for contamination already exists. Hydrologic sensitivity and system construction scores weight the final scores heavily. Having multiple potential contaminant sources in the 0 to 3-year time of travel zone (Zone 1B) and much agricultural land contribute to the overall ranking. In terms of total susceptibility, all three wells rate moderate for IOC, VOC, SOC, and microbial contamination. Well #6 rates as automatically high for SOC contaminants due to the November 1988 detection of Heptachlor and Dacthal.

Table 5. Summary of City of New Plymouth Susceptibility Evaluation

Well	**Susceptibility Scores[1]**									
	Hydrologic Sensitivity	Contaminant Inventory				System Construction	**Final Susceptibility Ranking**			
		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #6	M	M	M	M	L	M	M	H	H*[2]	M
Well #7	M	H	M	M	L	M	M	M	M	M
Well #8	M	M	M	M	L	M	M	M	M	M

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical
[2]H* - Indicates source automatically scored as high susceptibility due to presence of either a VOC, SOC, IOC above the maximum contaminant level or the presence of total coliform, fecal coliform, or E-coli bacteria in the tested drinking water

Susceptibility Summary

Water chemistry data show that no type of contamination currently threatens the City of New Plymouth drinking water system. However, Well #6 was previously contaminated with the SOCs Heptachlor and Dacthal in 1988.

The wells in the City of New Plymouth system takes their water in whole from the shallow, unconfined alluvial (river deposited material) aquifer. The shallow aquifer has been demonstrated to be a distinct water-bearing unit in terms of water quality, water yield, and the sources of recharge (DEQ, 2000). The shallow aquifer contains much higher levels of nitrate, lower levels of iron, and higher levels of arsenic than the deeper aquifer. Water yields from the shallow aquifer are significantly higher than from the deeper aquifer. Ground water in the shallow aquifer is recharged primarily from surface water irrigation, direct precipitation, and canal leakage.

Section 4. Options for Source Water Protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require education and surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective source water protection program is tailored to the particular local source water protection area. A community with a fully developed source water protection program will incorporate many strategies. For the City of New Plymouth, source water protection activities should focus on implementation of practices aimed at reducing the leaching of agricultural chemicals from agricultural land and from the various dairies within the designated source water areas. The City of New Plymouth should also be aware of the Group 1 site for the SOCs Atrazine and Simazine located about 100 feet from Well #8. Most of the designated areas are outside the direct jurisdiction of the City of New Plymouth. Partnerships with state and local agencies and industry groups should be established and are critical to success. The City should remain diligent in following the Wellhead Protection Ordinance. A new sanitary survey should be conducted on each of the wells. Disinfection practices should be implemented if a microbial contamination becomes a problem. Continued vigilance in keeping the well protected from surface flooding can also keep the potential for contamination reduced. Due to the time involved with the movement of ground water, wellhead protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. Source water protection activities for agriculture should be coordinated with the Idaho Department of Agriculture, the Soil Conservation Commission, the Gem Soil and Water Conservation District, and the Natural Resources Conservation Service.

Assistance

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Boise Regional DEQ Office (208) 373-0550

State DEQ Office (208) 373-0502

Website: http://www2.state.id.us/deq

Water suppliers serving fewer than 10,000 persons may contact John Bokor, Idaho Rural Water Association, at 1-800-962-3257 for assistance with wellhead protection strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.)

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

References Cited

Great Lakes-Upper Mississippi River Board of State and Provincial Public Health and Environmental Managers, 1997. "Recommended Standards for Water Works."

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Idaho Division of Environmental Quality, 1994. Ground Water and Soils Reconnaissance of the Lower Payette Area, Payette County, Idaho. Ground Water Quality Technical Report No. 5. Idaho Division of Environmental Quality. December 1994.

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Idaho Department of Environmental Quality, 1997. Design Standards for Public Drinking Water Systems. IDAPA 58.01.08.550.01.

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Idaho Department of Water Resources, 1993. Administrative Rules of the Idaho Water Resource Board: Well Construction Standards Rules. IDAPA 37.03.09.

Natural Resource Conservation Service, 1991. Idaho Snake-Payette Rivers Hydrologic Unit Plan of Work. March 1991.

United States Geological Survey, 1986. Quality of Ground Water in the Payette River Basin, Idaho. United States Geological Survey. Water Resources Investigation Report 86-4013.

University of Idaho. 1986. Ground Water Resources in a Portion of Payette County, Idaho. Idaho Water Resources Research Institute. University of Idaho. Moscow, Idaho. April 1986.

Attachment A

City of New Plymouth Susceptibility Analysis Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) 2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report Public Water System Name : NEW PLYMOUTH CITY OF Well# : WELL #6

Public Water System Number 3380008 12/6/00 8:17:03 AM

1. System Construction			SCORE
Drill Date	12/12/68		
Driller Log Available	YES		
Sanitary Survey (if yes, indicate date of last survey)	YES	1992	
Well meets IDWR construction standards	NO	1	
Wellhead and surface seal maintained	YES	0	
Casing and annular seal extend to low permeability unit	NO	2	
Highest production 100 feet below static water level	NO	1	
Well located outside the 100 year flood plain	YES	0	
	Total System Construction Score		4

2. Hydrologic Sensitivity			
Soils are poorly to moderately drained	YES	0	
Vadose zone composed of gravel, fractured rock or unknown	NO	0	
Depth to first water > 300 feet	NO	1	
Aquitard present with > 50 feet cumulative thickness	NO	2	
	Total Hydrologic Score		3

3. Potential Contaminant / Land Use - ZONE 1A			IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED PASTURE	1	1	1	1
Farm chemical use high	YES	2	0	0	
IOC, VOC, SOC, or Microbial sources in Zone 1A	YES	NO	NO	YES	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		3	1	1	1

Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)	YES	1	5	5	1
(Score = # Sources X 2) 8 Points Maximum		2	8	8	2
Sources of Class II or III leacheable contaminants or	YES	3	3	0	
4 Points Maximum		3	3	0	
Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2	0
Land use Zone 1B	Greater Than 50% Non-Irrigated Agricultural	2	2	2	2
Total Potential Contaminant Source / Land Use Score - Zone 1B		7	13	12	4

Potential Contaminant / Land Use - ZONE II					
Contaminant Sources Present	YES	2	0	2	
Sources of Class II or III leacheable contaminants or	YES	1	0	0	
Land Use Zone II	Greater Than 50% Non-Irrigated Agricultural	1	1	1	
Potential Contaminant Source / Land Use Score - Zone II		4	1	3	0

Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	NO	0	0	0	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	

Total Potential Contaminant Source / Land Use Score - Zone III	1	1	1	0
Cumulative Potential Contaminant / Land Use Score	15	16	17	5
4. Final Susceptibility Source Score	10	10	10	9
5. Final Well Ranking	Moderate	High	Moderate	Moderate

Ground Water Susceptibility Report Public Water System Name : NEW PLYMOUTH CITY OF Well# : WELL #7

Public Water System Number 3380008 10/30/2000 11:06:41 AM

1. System Construction		SCORE				
Drill Date	06/14/1978					
Driller Log Available	YES					
Sanitary Survey (if yes, indicate date of last survey)	YES	1992				
Well meets IDWR construction standards	NO	1				
Wellhead and surface seal maintained	YES	0				
Casing and annular seal extend to low permeability unit	YES	0				
Highest production 100 feet below static water level	NO	1				
Well located outside the 100 year flood plain	YES	0				
	Total System Construction Score	2				
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained	YES	0				
Vadose zone composed of gravel, fractured rock or unknown	NO	0				
Depth to first water > 300 feet	NO	1				
Aquitard present with > 50 feet cumulative thickness	NO	2				
	Total Hydrologic Score	3				
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score	
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2	
Farm chemical use high	YES	2	0	0		
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO	
	Total Potential Contaminant Source/Land Use Score - Zone 1A	4	2	2	2	
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)	YES	1	3	2	1	
(Score = # Sources X 2) 8 Points Maximum		2	6	4	2	
Sources of Class II or III leacheable contaminants or	YES	4	1	0		
4 Points Maximum		4	1	0		
Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2	0	
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4	
	Total Potential Contaminant Source / Land Use Score - Zone 1B	10	11	10	6	
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present	YES	2	2	2		
Sources of Class II or III leacheable contaminants or	YES	1	0	0		
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2		
	Potential Contaminant Source / Land Use Score - Zone II	5	4	4	0	
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present	YES	1	1	1		
Sources of Class II or III leacheable contaminants or	YES	1	0	0		
Is there irrigated agricultural lands that occupy > 50% of	YES	1	1	1		
	Total Potential Contaminant Source / Land Use Score - Zone III	3	2	2	0	

Cumulative Potential Contaminant / Land Use Score	22	19	18	8
4. Final Susceptibility Source Score	9	9	9	8
5. Final Well Ranking	Moderate	Moderate	Moderate	Moderate

Ground Water Susceptibility Report Public Water System Name : NEW PLYMOUTH CITY OF Well# : WELL #8

Public Water System Number 3380008 10/30/2000 11:06:57 AM

1. System Construction		SCORE				
Drill Date	12/07/1997					
Driller Log Available	YES					
Sanitary Survey (if yes, indicate date of last survey)	NO	0				
Well meets IDWR construction standards	YES	0				
Wellhead and surface seal maintained	NO	1				
Casing and annular seal extend to low permeability unit	YES	0				
Highest production 100 feet below static water level	NO	1				
Well located outside the 100 year flood plain	NO	1				
	Total System Construction Score	3				
2. Hydrologic Sensitivity						
Soils are poorly to moderately drained	YES	0				
Vadose zone composed of gravel, fractured rock or unknown	NO	0				
Depth to first water > 300 feet	NO	1				
Aquitard present with > 50 feet cumulative thickness	NO	2				
	Total Hydrologic Score	3				
3. Potential Contaminant / Land Use - ZONE 1A		IOC Score	VOC Score	SOC Score	Microbial Score	
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2	
Farm chemical use high	YES	2	0	0		
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO	
	Total Potential Contaminant Source/Land Use Score - Zone 1A	4	2	2	2	
Potential Contaminant / Land Use - ZONE 1B						
Contaminant sources present (Number of Sources)	YES	0	1	1	0	
(Score = # Sources X 2) 8 Points Maximum		0	2	2	0	
Sources of Class II or III leacheable contaminants or	YES	4	1	0		
4 Points Maximum		4	1	0		
Zone 1B contains or intercepts a Group 1 Area	YES	0	0	2	0	
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4	
	Total Potential Contaminant Source / Land Use Score - Zone 1B	8	7	8	4	
Potential Contaminant / Land Use - ZONE II						
Contaminant Sources Present	YES	2	2	2		
Sources of Class II or III leacheable contaminants or	YES	1	0	0		
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2		
	Potential Contaminant Source / Land Use Score - Zone II	5	4	4	0	
Potential Contaminant / Land Use - ZONE III						
Contaminant Source Present	YES	1	1	1		
Sources of Class II or III leacheable contaminants or	NO	0	0	0		
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0		
	Total Potential Contaminant Source / Land Use Score - Zone III	1	1	1	0	

Cumulative Potential Contaminant / Land Use Score	18	14	15	6
4. Final Susceptibility Source Score	10	9	9	8
5. Final Well Ranking	Moderate	Moderate	Moderate	Moderate